I claim:

1. A medical pump for use with a cassette having a pumping chamber, comprising:

a pumping element adapted to intermittently pressurize the pumping chamber during a pumping cycle;

means for closing the pumping chamber to flow during at least a portion of the pump cycle when the pumping chamber is pressurized by the pumping element; and

a single pressure sensor operatively connected to the pumping element to detect the pressure exerted by the pumping element on the pumping chamber.

2. The medical pump of claim 1, wherein said means includes an inlet control element and an outlet control element adapted to close the pumping chamber to flow during at least a portion of the pump cycle when the pumping chamber is pressurized by the pumping element; and a camshaft associated with the pumping element, inlet control element, and outlet control element for closing the pumping chamber to flow during at least a portion of the pump cycle when the pumping chamber is pressurized by the pumping element.

3. The medical pump of claim 1, further including a processing unit in electronic communication with the pressure sensor, wherein the processing unit processes pressure data from the pressure sensor to determine the operating condition of the pump.

4. The medical pump of claim 3, wherein the operating condition determined is blocked fluid flow, no fluid in the line, no cassette associated with the pump, proper

pump priming, or proper valve sealing.

5. The medical pump of claim 3, further including a position sensor in electronic communication with the processing unit and operatively associated with the pumping element to detect the position of the pumping element, wherein the processing unit processes position data from the position sensor to associate the incoming pressure data with a particular portion of the pump cycle.

6. The medical pump of claim 1, wherein the pumping element includes a piston slider assembly having a piston head connected to a main body, the piston head is adapted to contact the pumping chamber, and the single pressure sensor is connected to the pumping element between the piston head and the main body.

7. A medical pump for use with a cassette having a pumping chamber, comprising:

a pumping element including a piston slider assembly adapted to intermittently pressurize the pumping chamber during a pumping cycle, the piston slider assembly having a piston head connected to a main body, the piston head is adapted to contact the pumping chamber; and

a pressure sensor is connected to the pumping element between the piston head and the main body to detect the pressure exerted by the pumping element on the pumping chamber.

8. The medical pump of claim 7, wherein the piston slider assembly includes a bore which passes through the

main body and provides a surface for transferring force from a pump motor to the pumping element.

9. The medical pump of claim 7, wherein the piston slider assembly includes slider elements which permit the piston slider assembly to be slidably associated with a pump housing.

10. The medical pump of claim 7, further including a processing unit in electronic communication with the pressure sensor, wherein the processing unit processes pressure data from the pressure sensor to determine the operating condition of the pump.

11. The medical pump of claim 10, wherein the operating condition determined is blocked fluid flow, no fluid in the line, no cassette associated with the pump, proper pump priming, or proper valve sealing.

12. The medical pump of claim 10, further including a position sensor in electronic communication with the processing unit and operatively associated with the pumping element to detect the position of the pumping element, wherein the processing unit processes position data from the position sensor to associate the incoming pressure data with a particular portion of the pump cycle.

13. The medical pump of claim 7, further including means for closing the pumping chamber to flow during at least a portion of the pump cycle when the pumping chamber is pressurized by the pumping element.

14. The medical pump of claim 7, further including an inlet control element and an outlet control element adapted to close the pumping chamber to flow during at least a portion of the pump cycle when the pumping chamber is pressurized by the pumping element; and a camshaft associated with the pumping element, inlet control element, and outlet control element for closing the pumping chamber to flow during at least a portion of the pump cycle when the pumping chamber is pressurized by the pumping element.

15. The medical pump of claim 7, wherein the pressure sensor is a force sensor and is the only pressure sensor included in the medical pump.

16. A medical pump for use with a cassette having a pumping chamber, comprising:

a pumping element adapted to intermittently pressurize the pumping chamber during a pumping cycle;

an inlet control element and an outlet control element adapted to close the pumping chamber to flow;

a camshaft associated with the pumping element, inlet control element, and outlet control element for closing the pumping chamber to flow during at least a portion of the pump cycle when the pumping chamber is pressurized by the pumping element; and

a pressure sensor operatively connected to the pumping element to detect the pressure exerted by the pumping element on the pumping chamber.

17. The medical pump of claim 16, further including a processing unit in electronic communication with the pressure sensor, wherein the processing unit processes

pressure data from the pressure sensor to determine the operating condition of the pump.

18. The medical pump of claim 17, wherein the operating condition determined is blocked fluid flow, no fluid in the line, no cassette associated with the pump, proper pump priming, or proper valve sealing.

19. The medical pump of claim 17, further including a position sensor in electronic communication with the processing unit and operatively associated with the pumping element to detect the position of the pumping element, wherein the processing unit processes position data from the position sensor to associate the incoming pressure data with a particular portion of the pump cycle.

20. The medical pump of claim 16, wherein the pumping element includes a piston slider assembly having a piston head connected to a main body, the piston head is adapted to contact the pumping chamber, and the single pressure sensor is connected to the pumping element between the piston head and the main body.

21. The medical pump of claim 16, wherein the pressure sensor is the only pressure sensor included in the medical pump.

22. The medical pump of claim 21, wherein the pressure sensor is a force sensor.